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The Mneme project is an investigation of techniques for integrating programming language and database features to provide better support for cooperative, information-intensive tasks such as computer-aided software engineering. The project strategy is to implement efficient, distributed, persistent programming languages. We report here on the Mneme persistent object store, a fundamental component of the project, discussing its design and initial prototype. Mneme stores objects

#### 4 [The design, implementation, and evaluation of Jade](#)



Martin C. Rinard, Monica S. Lam

May 1998 **ACM Transactions on Programming Languages and Systems (TOPLAS)**,  
Volume 20 Issue 3

**Publisher:** ACM Press

Full text available: [pdf\(576.88 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)

Jade is a portable, implicitly parallel language designed for exploiting task-level concurrency. Jade programmers start with a program written in a standard serial, imperative language, then use Jade constructs to declare how parts of the program access data. The Jade implementation uses this data access information to automatically extract the concurrency and map the application onto the machine at hand. The resulting parallel execution preserves the semantics of the original serial program ...

**Keywords:** parallel computing, parallel programming languages

#### 5 [Transactional memory: architectural support for lock-free data structures](#)



Maurice Herlihy, J. Eliot B. Moss

May 1993 **ACM SIGARCH Computer Architecture News , Proceedings of the 20th annual international symposium on Computer architecture ISCA '93**, Volume 21 Issue 2

**Publisher:** ACM Press

Full text available: [pdf\(1.10 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

A shared data structure is lock-free if its operations do not require mutual exclusion. If one process is interrupted in the middle of an operation, other processes will not be prevented from operating on that object. In highly concurrent systems, lock-free data structures avoid common problems associated with conventional locking techniques, including priority inversion, convoying, and difficulty of avoiding deadlock. This paper introduces transactional memory

#### 6 [Minos: Architectural support for protecting control data](#)



Jedidiah R. Crandall, S. Felix Wu, Frederic T. Chong

December 2006 **ACM Transactions on Architecture and Code Optimization (TACO)**,  
Volume 3 Issue 4

**Publisher:** ACM Press

Full text available: [pdf\(531.41 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

We present Minos, a microarchitecture that implements Biba's low water-mark integrity policy on individual words of data. Minos stops attacks that corrupt control data to hijack program control flow, but is orthogonal to the memory model. Control data is any data that is loaded into the program counter on control-flow transfer, or any data used to calculate such data. The key is that Minos tracks the integrity of all data, but protects control flow by checking this integrity when a program uses ...

**Keywords:** Control data, buffer overflow, worms



### Secure and selective dissemination of XML documents

Elisa Bertino, Elena Ferrari

August 2002 **ACM Transactions on Information and System Security (TISSEC)**, Volume 5  
Issue 3

**Publisher:** ACM Press

Full text available: pdf(678.34 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

XML (*eXtensible Markup Language*) has emerged as a prevalent standard for document representation and exchange on the Web. It is often the case that XML documents contain information of different sensitivity degrees that must be selectively shared by (possibly large) user communities. There is thus the need for models and mechanisms enabling the specification and enforcement of access control policies for XML documents. Mechanisms are also required enabling a secure and selective dissemination ...

**Keywords:** Access control, XML, secure distribution

### 8 Logged virtual memory



D. R. Cheriton, K. J. Duda

December 1995 **ACM SIGOPS Operating Systems Review , Proceedings of the fifteenth ACM symposium on Operating systems principles SOSP '95**, Volume 29  
Issue 5

**Publisher:** ACM Press

Full text available: pdf(1.52 MB) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

### 9 Real-time shading



Marc Olano, Kurt Akeley, John C. Hart, Wolfgang Heidrich, Michael McCool, Jason L. Mitchell, Randi Rost

August 2004 **ACM SIGGRAPH 2004 Course Notes SIGGRAPH '04**

**Publisher:** ACM Press

Full text available: pdf(7.39 MB) Additional Information: [full citation](#), [abstract](#)

Real-time procedural shading was once seen as a distant dream. When the first version of this course was offered four years ago, real-time shading was possible, but only with one-of-a-kind hardware or by combining the effects of tens to hundreds of rendering passes. Today, almost every new computer comes with graphics hardware capable of interactively executing shaders of thousands to tens of thousands of instructions. This course has been redesigned to address today's real-time shading capabilities ...

### 10 A structural view of the Cedar programming environment



Daniel C. Swinehart, Polle T. Zellweger, Richard J. Beach, Robert B. Hagmann

August 1986 **ACM Transactions on Programming Languages and Systems (TOPLAS)**,  
Volume 8 Issue 4

**Publisher:** ACM Press

Full text available: pdf(6.32 MB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

This paper presents an overview of the Cedar programming environment, focusing on its overall structure—that is, the major components of Cedar and the way they are organized. Cedar supports the development of programs written in a single programming language, also called Cedar. Its primary purpose is to increase the productivity of programmers whose activities include experimental programming and the development of prototype software systems for a high-performance personal computer. T ...

### 11 Anatomy of a native XML base management system

T. Fiebig, S. Helmer, C.-C. Kanne, G. Moerkotte, J. Neumann, R. Schiele, T. Westmann  
 December 2002 **The VLDB Journal — The International Journal on Very Large Data  
 Bases**, Volume 11 Issue 4

**Publisher:** Springer-Verlag New York, Inc.

Full text available:  [pdf\(300.97 KB\)](#) Additional Information: [full citation](#), [abstract](#), [citations](#), [index terms](#)

Several alternatives to manage large XML document collections exist, ranging from file systems over relational or other database systems to specifically tailored XML base management systems. In this paper we give a tour of Natix, a database management system designed from scratch for storing and processing XML data. Contrary to the common belief that management of XML data is just another application for traditional databases like relational systems, we illustrate how almost every component in a ...

**Keywords:** Database, XML


## 12 "Topologies"—distributed objects on multicomputers



Karsten Schwan, Win Bo

May 1990 **ACM Transactions on Computer Systems (TOCS)**, Volume 8 Issue 2

**Publisher:** ACM Press

Full text available:  [pdf\(3.83 MB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)

Application programs written for large-scale multicomputers with interconnection structures known to the programmer (e.g., hypercubes or meshes) use complex communication structures for connecting the applications' parallel tasks. Such structures implement a wide variety of functions, including the exchange of data or control information relevant to the task computations and/or the communications required for task synchronization, message forwarding/filtering under program control, and so on ...


## 13 Parallel execution of prolog programs: a survey



Gopal Gupta, Enrico Pontelli, Khayri A.M. Ali, Mats Carlsson, Manuel V. Hermenegildo

July 2001 **ACM Transactions on Programming Languages and Systems (TOPLAS)**,  
 Volume 23 Issue 4

**Publisher:** ACM Press

Full text available:  [pdf\(1.95 MB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Since the early days of logic programming, researchers in the field realized the potential for exploitation of parallelism present in the execution of logic programs. Their high-level nature, the presence of nondeterminism, and their referential transparency, among other characteristics, make logic programs interesting candidates for obtaining speedups through parallel execution. At the same time, the fact that the typical applications of logic programming frequently involve irregular computation ...

**Keywords:** Automatic parallelization, constraint programming, logic programming, parallelism, prolog


## 14 Security: SECA: security-enhanced communication architecture



Joel Coburn, Srivaths Ravi, Anand Raghunathan, Srimat Chakradhar

September 2005 **Proceedings of the 2005 international conference on Compilers, architectures and synthesis for embedded systems CASES '05**

**Publisher:** ACM Press

Full text available:  [pdf\(396.53 KB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

In this work, we propose and investigate the idea of enhancing a System-on-Chip (SoC) communication architecture (the fabric that integrates system components and carries the

communication traffic between them) to facilitate higher security. We observe that a wide range of common security attacks are manifested as abnormalities in the system-level communication traffic. Therefore, the communication architecture, with its global system-level visibility, can be used to detect them. The communicati ...

**Keywords:** AMBA Bus, access control, architecture, attacks, bus, communication, digital rights management (DRM), intrusion detection, security, security-aware design, small embedded systems, system-on-chip (SoC)

15 PELLPACK: a problem-solving environment for PDE-based applications on multicomputer platforms



E. N. Houstis, J. R. Rice, S. Weerawarana, A. C. Catlin, P. Papachiou, K.-Y. Wang, M. Gaitatzes

March 1998 **ACM Transactions on Mathematical Software (TOMS)**, Volume 24 Issue 1

**Publisher:** ACM Press

Full text available: pdf(26.30 MB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)

The article presents the software architecture and implementation of the problem-solving environment (PSE) PELLPACK for modeling physical objects described by partial differential equations (PDEs). The scope of this PSE is broad, as PELLPACK incorporates many PDE solving systems, and some of these, in turn, include several specific PDE solving methods. Its coverage for 1D, 2D, and 3D elliptic or parabolic problems is quite broad, and it handles some hyperbolic problems. Since a PSE should p ...

**Keywords:** PDE language, execution models, knowledge bases, libraries, parallel reuse methodologies, problem-solving environments, programming-in-the-large, software bus

16 Compiler and runtime support for efficient software transactional memory



Ali-Reza Adl-Tabatabai, Brian T. Lewis, Vijay Menon, Brian R. Murphy, Bratin Saha, Tatiana Shpeisman

June 2006 **ACM SIGPLAN Notices , Proceedings of the 2006 ACM SIGPLAN conference on Programming language design and implementation PLDI '06**, Volume 41 Issue 6

**Publisher:** ACM Press

Full text available: pdf(211.55 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Programmers have traditionally used locks to synchronize concurrent access to shared data. Lock-based synchronization, however, has well-known pitfalls: using locks for fine-grain synchronization and composing code that already uses locks are both difficult and prone to deadlock. Transactional memory provides an alternate concurrency control mechanism that avoids these pitfalls and significantly eases concurrent programming. Transactional memory language constructs have recently been proposed as ...

**Keywords:** code generation, compiler optimizations, locking, synchronization, transactional memory, virtual machines

17 Model-driven development of Web applications: the AutoWeb system



Piero Fraternali, Paolo Paolini

October 2000 **ACM Transactions on Information Systems (TOIS)**, Volume 18 Issue 4

**Publisher:** ACM Press

Full text available: pdf(6.94 MB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

This paper describes a methodology for the development of WWW applications and a tool environment specifically tailored for the methodology. The methodology and the development environment are based upon models and techniques already used in the hypermedia, information systems, and software engineering fields, adapted and blended in an original mix. The foundation of the proposal is the conceptual design of WWW applications, using HDM-lite, a notation for the specification of structure, nav ...

**Keywords:** HTML, WWW, application, development, intranet, modeling

18 Tradeoffs in transactional memory virtualization



JaeWoong Chung, Chi Cao Minh, Austen McDonald, Travis Skare, Hassan Chafi, Brian D. Carlstrom, Christos Kozyrakis, Kunle Olukotun

October 2006 **ACM SIGPLAN Notices , ACM SIGOPS Operating Systems Review , ACM SIGARCH Computer Architecture News , Proceedings of the 12th international conference on Architectural support for programming languages and operating systems ASPLOS-XII**, Volume 41 , 40 , 34 Issue 11 , 5 ,

**Publisher:** ACM Press

Full text available: pdf(325.77 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

For transactional memory (TM) to achieve widespread acceptance, transactions should not be limited to the physical resources of any specific hardware implementation. TM systems should guarantee correct execution even when transactions exceed scheduling quanta, overflow the capacity of hardware caches and physical memory, or include more independent nesting levels than what is supported in hardware. Existing proposals for TM virtualization are either incomplete or rely on complex hardware impleme ...

**Keywords:** OS support, chip multi-processor, transactional memory, virtualization

19 Model driven security: From UML models to access control infrastructures



David Basin, Jürgen Doser, Torsten Lodderstedt

January 2006 **ACM Transactions on Software Engineering and Methodology (TOSEM)**, Volume 15 Issue 1

**Publisher:** ACM Press

Full text available: pdf(968.83 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

We present a new approach to building secure systems. In our approach, which we call Model Driven Security, designers specify system models along with their security requirements and use tools to automatically generate system architectures from the models, including complete, configured access control infrastructures. Rather than fixing one particular modeling language for this process, we propose a general schema for constructing such languages that combines languages for modeling systems with ...

**Keywords:** Model Driven Architecture, Object Constraint Language, Role-Based Access Control, Unified Modeling Language, metamodeling, security engineering

20 Proxy-based acceleration of dynamically generated content on the world wide web:



An approach and implementation

Anindya Datta, Kaushik Dutta, Helen Thomas, Debra Vandermeer, Krithi Ramamritham

June 2004 **ACM Transactions on Database Systems (TODS)**, Volume 29 Issue 2

**Publisher:** ACM Press

Full text available: pdf(927.23 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

As Internet traffic continues to grow and websites become increasingly complex,

performance and scalability are major issues for websites. Websites are increasingly relying on dynamic content generation applications to provide website visitors with dynamic, interactive, and personalized experiences. However, dynamic content generation comes at a cost---each request requires computation as well as communication across multiple components. To address these issues, various dynamic content caching ap ...

**Keywords:** Edge caching, caching dynamically generated content, fragment caching, implementation, proxy caching, world wide web

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